# The Chemical Age

**A Weekly Journal Devoted to Industrial and Engineering Chemistry**

BOUVERIE HOUSE, 154, FLEET STREET, LONDON, E.C.4

Telegrams : ALLANGAS FLEET LONDON
Telephone : CENTRAL 3212 (10 lines)
GLASGOW : 116, Hope Street (Central 3970)
BIRMINGHAM : Daimler House, Paradise Street (Midland 0784-5)
THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers, Limited

VOL. XLII. No. 1095 June 22, 1940 Annual Subscription, 21s. Overseas, 26s.

# Agriculture and the Chemical Industry

APART altogether from purely military considerations, the occupation of France by the enemy has made the conservation and proper use of our own natural resources more of a vital matter than ever; and in this connection chemistry has a large part to play. For example, the articles that have recently appeared in THE CHEMICAL AGE on the potato products industry, will have achieved a useful purpose if they have helped to focus attention upon the necessity for regarding much of our agricultural products as a raw material for chemical industry. The growing of the crops is the farmer's specialised work; the harvesting of them is to a large extent his work, though it can be assisted by ingenious engineering devices; in the working-up of the crops to commercial products the chemical engineer can be of vital assistance, more particularly in the use he can make of wasted materials that can be turned into valuable by-products.

Drying is a well-understood unit process of chemical engineering. It is being applied now to the drying of grass for fodder, the food value of the young spring grass being retained for future use by drying in producer-gas-fired plants, thus putting a new complexion on the Biblical conception of " the grass of the field which to-day is, and to-morrow is cast into the oven." The oven is now used to preserve its goodness, not for its destruction as waste material. Some farmers prefer the use of dryers for saving crops threatened by the weather. It has been recorded how hay-drying has been practised in Wiltshire, the coal-fired dryer being put into operation only when the weather changed. The dryer can also be used for the harvest. Many a harvest has been ruined by persistent wet weather, but it is now claimed that crops of oats and barley have been put through a dryer with excellent results. It is argued by those in a position to know that quantities of human and cattle food could be saved by the installation of farm drying plants. An essential difficulty in this as in other branches of the treatment of agricultural produce is that when nature builds by organic growth she usually insists on her products having a very high water content. In consequence it is impossible economically to transport the raw crops any considerable distance for treatment.

Straw has always been regarded by the farmer as an unlikely source for the production of foodstuffs, but it is now known that the research staff of I.C.I. has been working successfully on the conversion of straw into animal foodstuffs by treatment with dilute caustic soda solution which " pre-digests " the cellulose and thereby releases its digestible constituents. Again there is the problem of transport. It has to be decided whether to design and sell small plants to the individual farmer, or to put down factory plants in co-operation with the larger firms interested in the manufacture of animal foodstuffs, who would treat the straw centrally and use it to make a blended food. This problem of local or central application of chemical engineering processes on the farm continually crops up. It has been suggested that travelling factories—dryers, digesters or potato-meal plants—should be erected on lorries that can travel from farm to farm as the threshing machines have done in the past.

There is much to be said in favour of the introduction of potato processing into this country as described in THE CHEMICAL AGE. It is true that we import in normal times some two million tons of potatoes into this country as food, but it is also true that we have a heavy wastage in our home-grown potatoes. Before the war the Potato Marketing Board refused to allow smalls below a certain size to be marketed for domestic consumption. This wastage amounts on our crop of 3,500,000 tons to some 500,000 tons. In addition to this there is an inevitable wastage of potatoes that become unfit for food through frost, wet and other natural agencies. Since 5 tons of potatoes yield 1 ton of starch, we could manufacture not less than 100,000 tons of starch from potatoes regarded in pre-war days as unfit for human consumption. We imported at that time 20,000 tons of potato starch from Holland and about the same quantity from the rest of Europe, according to our correspondent. What the position is to-day when we can no longer get these supplies, we do not pretend to know; nor do we know how much of the potato crop would be available to-day for this purpose. No doubt the Minister of Agriculture has had his attention drawn to the possibilities of utilising the processes of chemical engineering to dispose advantageously of agricultural products. Our correspondent states that there is an estimated annual loss of between 40 and 50 per cent. of our potatoes through decomposition, frost, etc.; if this loss could be utilised in the way he suggests, action should be taken immediately. On the other hand, we do not suppose that there could be any economic, nor even war-time, justification for the production of alcohol from potatoes grown specially for the purpose in so densely populated a country as this. Unless memory deceives us this subject was thoroughly investigated a few years ago and this was the conclusion reached. In this country chemical engineering must be applied to agriculture to save what would otherwise be lost or to turn waste materials into valuable by-products.

CONTENTS


| | |
|---|---|
| *Agriculture and the Chemical Industry* | 331 |
| *Notes and Comments* | 332 |
| *Water-Soluble Synthetic Resins* | 333 |
| *Suggested Use for Atomic Hydrogen* | 334 |
| *A Useful Balance* | 334 |
| *Alkali Activation of Carbonised Fuel* | 335 |
| *Recent Trade Literature* | 336 |
| *Soap Suppliers Admit Error* | 337 |
| *Motor Oil Regeneration* | 337 |
| *Flow and Drop Points of Fats* | 337 |
| *Mercury Figures for the U.S.A.* | 337 |
| *Personal Notes* | 338 |
| *Export Groups Formed* | 338 |
| *British Chemical Prices* | 338 |
| *General News from Week to Week* | 339 |
| *Commercial Intelligence—Stocks and Shares* | 340 |


# NOTES AND COMMENTS

## One Grand Army

THE latest shock, the French Government's request for terms of peace, is without doubt the greatest that the British people have sustained in the astounding events of the last two months. It has been a revelation in many ways, more particularly to the enemy. It caused an instantaneous rally around the Prime Minister, whose fighting speech in the House of Commons on Tuesday was a rebuke to the faint-hearted minority and a tremendously stimulating tonic for the rest. Mr. Churchill did not breathe confidence in the outcome of this titanic struggle without adducing convincing reasons for his faith. The whole burden has now been transferred to the shoulders of the British Empire, and this island, its citadel, is called upon to bear the brunt of the last of the Nazi onslaughts which will decide the future of European civilisation. The fighting forces are here intact and in wonderful spirit. Behind them stand the men and women of the industrial army upon whom they depend for aeroplanes, guns and military supplies of every sort. For the first time in our history the entire nation, military and civilian, is united in one grand army. Workers have already given ample evidence of their resolute determination never to fail the men in the fighting line. All thoughts of self are being banished and British industry and commerce are girding their loins for a productive effort unprecedented in the history of this or any other people. The overwhelming need in the immediate future is for every man and woman to sit tight, hold on, carry out the allotted task and preserve cheerfulness and courage in the face of whatever may befall.

## International Chemical Publications

THE pollution by barbarism of one of the world's greatest founts of culture, both humanistic and scientific, has been consummated during the last week, and Paris is now in German hands. It is an ironical coincidence that on the same morning that the news of the German entry into Paris reached London, there should have arrived in THE CHEMICAL AGE office the latest publications of the Union Internationale de Chimie, whose headquarters were in Paris. These are the *International Table of Atomic Weights* (10th Report; 1940), the *International Table of Stable Isotopes* (5th Report; 1940), and *Rules for the Naming of Inorganic Compounds*. A special touch of irony is added by the fact that the first two of these pamphlets are printed in English, German, and French (in that order). It is difficult to-day to see much hope for the re-establishment of a stable international foundation for science, but perhaps Professor Bogert, of Columbia University, who is president of the Union, may be able to preserve sufficient detachment to build up some new world-wide structure out of the wreck. At any rate, here are three extremely useful and interesting publications. The tables, of course, are primarily of interest to the physical chemist, but the rules for naming compounds are well worth study on the part of the industrial man, especially in the laboratory. There is much difficulty in abandoning the old names, such as "nitrate of potash," "oil of vitriol," and the like, in commercial practice; but they are incorrect and should be given up. In a different category are the historical names that are free from false scientific significance, such as "saltpetre," "quicklime," and so on; they can remain. Actually, however, there is much to be said for formulae; their significance is the same in all languages and for saving space they are unequalled.

## Atmospheric Pollution

REPRESENTATIVES of local authorities and other bodies co-operating with the D.S.I.R. in the investigation of atmosphere pollution met, by courtesy of the London County Council, in conference at the County Hall recently. Among others, representatives of Cardiff, Dagenham, Glasgow, London County, Halifax, Manchester, Newcastle, Salford, Sheffield, Rotherham, Westminster, the British Commercial Gas Association and Cadbury Brothers, were present. The conference, in considering its annual report to the co-operating bodies, unanimously agreed that while contribution to the war effort was the first duty and desire of every organisation, the need for vigilant attention to the purity of the atmosphere had by no means decreased since the outbreak of the war. The wasteful burning of fuel, and the detriment to the nation's health caused by pollution, were stressed as two aspects of the problem that must not be forgotten, particularly in wartime. The conference therefore urged all local authorities to do whatever lay in their power to maintain the investigation. At the close of the meeting, Professor W. H. Roberts, M.Sc., F.I.C., of Liverpool, was unanimously elected Chairman of the Conference, in succession to Alderman Adams, M.P., of Newcastle, who had held the office for three years in succession.

## U.S.A. Synthetic Rubber Discovery

IT was stated recently that the Standard Oil Co., of New Jersey, U.S.A., was taking an interest in the possibilities of "Buna," the German synthetic rubber manufactured by I. G. Farbenindustrie. Another American company, the B. F. Goodrich Co., one of the largest United States manufacturers of rubber products, has now announced that they are successfully producing synthetic rubber on a commercially profitable basis. This rubber is known as "Ameripol," so called, it is stated, because it is a polymer of American materials. The new product has apparently passed the experimental stages, for the Goodrich Company have announced that motor car tyres in which natural rubber is displaced by Ameripol to the extent of from 50 to as much as 90 per cent. of the whole will be on sale to the public early in July. Ameripol tyres are expected to cost at first one-third more than natural rubber tyres, but as production increases the price will be reduced. It has been suggested that the production of Ameripol and of Buna would make the United States self-sufficient if the supply of natural rubber was at any time cut off.

# WATER-SOLUBLE SYNTHETIC RESINS

## Some Recent Developments

By LOUIS LIGHT, M.Sc., Ph.D., A.I.C.

THE earliest synthetic resins of commerce were distinguished by their complete insolubility in water. As time went on and more insight was gained into the reaction mechanisms, it became possible to isolate stable water-soluble intermediates and thus to dispense in some cases with the use of expensive and inflammable organic solvents. Intermediate forms of the thermosetting resins can thus be applied in aqueous solutions without sacrificing the ultimate insolubility and infusibility which are among their most valuable qualities. Such solutions may be used in textile processing, manufacture of brake-linings and plywood. Resins belonging to the family of thermoplastic polymerisation products, as distinct from the thermosetting condensation resins, also include water-soluble representatives. These must not be confused with the water-insoluble polymer resins (*e.g.*, acrylic and methacrylic esters) which can be used in the form of aqueous emulsions. A few recent developments in the field of water-soluble resins are summarised below.

*Urea-formaldehyde resins.*—Waxy or soft resinous intermediates are formed when a powdered mixture of urea and a solid polymer of formaldehyde (trioxymethylene) is treated with a catalyst in the absence of any substantial amount of water. The products are soluble in both hot and cold water and the dried coatings are converted to the hard and infusible conditions by heating to 60°-100° C. (F.P. 817,660, Fabriques de Laire). The cibanoid products (Ciba) are also aqueous solutions of urea-formaldehyde resins which find application in various impregnation processes.

*Phenol-formaldehyde resins.*—By rigid control of the *p*H during the phenol-formaldehyde condensation at a moderate temperature (60° C.) it is possible to obtain a syrup which is miscible with water in all proportions and can be used in this form for impregnation of fibrous materials. In addition it blends easily with latex emulsions (U.S.P. 2,190,672, Bakelite Corporation).

*Vinyl ketone-aldehyde resins.*—Thick water-soluble syrups have been prepared by reacting vinyl methyl ketone with a water-soluble aldehyde under neutral or slightly acid conditions. A small amount of strong alkali is incorporated before use, *e.g.*, as plywood adhesive, to promote insolubilisation (F.P. 825,417, I.G.).

### Melamine

*Azine-formaldehyde resins.*—The best-known member of this comparatively new class of thermosetting resins is melamine-formaldehyde. Melamine is 2, 4, 6-triamino-1, 2, 5-triazine (see THE CHEMICAL AGE, Jan. 27, 1940, p. 53). Water-soluble powders are marketed for the plywood industry and offer the advantages of freedom from colour and odour, bacterial resistance and rapid set-up after application. Certain grades (Melocol A and B) are of particular interest in aeronautical construction owing to their high moisture resistance. Aqueous solutions containing a hardening agent have been suggested as impregnating agents for wound bandages which are applied while still wet and later become waterproof.

*Vinyl acetal resins.*—Polyvinyl acetate resins can be modified with aldehydes to form acetal-type resins which are superior in several respects to the parent resins. They have proved particularly successful in the safety-glass field. Some of the polyvinyl mixed acetals, *e.g.*, polyvinyl benzaldehyde-butyraldehyde acetal, possess an exceptionally low moisture susceptibility and are of interest as photographic film supports in place of cellulose esters. At the other extreme we have resins in the same family which readily dissolve in water and have been suggested as media for water-soluble dyes in the manufacture of photographic light filters. These resins are partially hydrolysed. Those with a hydroxyl content corresponding to at least 15 per cent. polyvinyl alcohol are only soluble in water at temperatures below about 15° C.; those with hydroxyl contents equivalent to 30-60 per cent. polyvinyl alcohol are soluble at higher temperatures, in some cases at 40° C. In preparing light filters, a dyestuff, ordinarily used in a gelatin medium, is dissolved in an aqueous solution of the polyvinyl acetal resin and coated on to a glass or other support at a temperature sufficiently low to prevent precipitation of the resin while drying (U.S.P. 2,193,035, Eastman Kodak Co.).

*Polyvinyl ethers.*—Some of the vinyl ether resins combine water-solubility with great adhesive power. Typical examples are polyvinyl methyl ether and polyvinyl ethylene glycol ether. Their employment in surgical plasters has been suggested (G.P. 663,779, I.G.).

*Polyamide resins.*—The Nylon textile resins which are insoluble in water and common organic solvents are believed to result from condensation of a saturated aliphatic dibasic acid with a saturated diamine, in both of which there is an uninterrupted sequence of carbon atoms. Typical components specified in the Nylon patents are adipic acid and hexamethylene diamine. Any departure from this structure is reflected in a change in the properties of the superpolyamide resins. To obtain resins which dissolve in water, for example, one of the components should contain one or more oxygen atoms to break the continuity of the carbon chain. Thus the resin from adipic acid and triglycol diamine is soluble in water, alcohol, and dioxan. Its high melting point (185° C.) is typical of superpolyamides used in textile fabrication. Fabrics spun from filaments of water-soluble polyamides are useful as ground fabrics in lace and embroidery manufacture since they do not lose their solubility after application and can be conveniently removed by washing (U.S.P. 2,191,556, E. I. du Pont de Nemours). Other polyamides have been produced from unsaturated acids or esters, and are of interest for the animalisation of cellulosic fibres. A water-soluble resin can be derived from maleic anhydride and ethylene diamine, or from acrylic acid and triethylene tetramine and further condensation with formaldehyde (F.P. 849,348, I.G.).

*Polybasic oxyacid-polyhydric alcohol resins.*—Substitutes for natural mucilages in operations like paper and textile sizing are obtained by condensation between components such as glycerine and citric acid. These resins are readily soluble in water. In some respects the glycerocitrates resemble the well-known resins of the glycol boriborate type. A useful substitute for glycerine in the production of water-soluble citric acid resins is sorbitol (B.P. 505,016, Atlas Powder Co.).

*Glycol maleates.*—If the reaction between an unsaturated dibasic acid and certain long-chain glycols is interrupted before the acid value falls below a certain level, the products are water-soluble resins or viscous liquids. Their value resides in their oxygen-convertibility, *i.e.*, their property of hardening and eventually becoming completely insoluble on exposure to the air, somewhat in the same way as natural drying oils. A case in point is the oil with acid value of not less than 70 derived from condensation between hexaethylene glycol and maleic anhydride. Such products can be used in aqueous solution for the impregnation of paper, the plasticisation of urea-formaldehyde resins and glue, and as ingredients of compositions containing water-soluble cellulose ethers. (U.S.P. 2,166,542, American Cyanamid Company).

*Quaternary pyridinium derivatives.*—Resins or waxes readily dissolving in water have been obtained by reacting a pyridone imide compound, such as N-methyl-α-pyridone methyl imide, with an organic acid halide (acetyl chloride, benzoyl chloride). The resins are brown to yellow in colour and appear to possess a quaternary pyridinium structure. They are notable for great foaming power even in very dilute aqueous solutions (B.P. 425,435, Chem. Fabrik von Heyden).

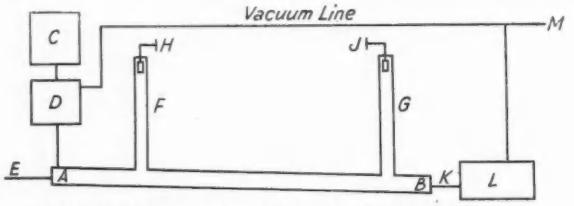
# Suggested Use for Atomic Hydrogen

## Treatment of Liquid Hydrocarbons

A SUGGESTION for the use of atomic hydrogen for the treatment of liquid hydrocarbons, in places where molecular hydrogen is now used, is made by the Compagnie Française de Raffinage (Fr. Pat. 853,782). Their experiments indicate that this is possible provided that the following conditions are fulfilled :

(1) that the hydrocarbon is free from gas;
(2) that the gas is loaded with moisture;
(3) that the hydrocarbon is treated in a thin layer by the atomic H;
(4) that the hydrogen is produced in contact with or in immediate proximity to the hydrocarbon;
(5) that the reaction takes place under a vacuum between 0.5 and 30.0 mm. of mercury;
(6) that the electrodes used to produce the atomic hydrogen are as far as possible from the hydrocarbon; and
(7) that the hydrogen atoms be directed in their course by a magnetic or an electrostatic field.

The treatment is carried out in an apparatus, the principal part of which is a tube of about 2.5 metres in length (AB) in glass or some other insulating material, sloped to permit a flow of hydrocarbon along the tube. In order to permit the hydrocarbon to flow in a thin layer through the tube, this has an oval section and is provided with a flat glass plate sealed in across its horizontal diameter. The supply of hydrocarbon is provided from a tank C from which it flows through a cock to a second tank D, and thence, by another cock, into the upper end of the tube AB. Hydrogen is admitted to the tube at the same end by a cock E, the hydrogen being loaded with water vapour before admission. Rising vertically from the tube AB are two tubes of a diameter of between 5 and 20 mm. (F, G), which serve to contain the electrodes (H, J). By running a suitable electric current, say between 5 and 25 kV., between these electrodes, the hydrogen in the tube AB is broken down into atomic hydrogen which




**Atomic Hydrogen Apparatus for Treating Hydrocarbons**

acts upon the hydrocarbons in the tube with much greater speed and ease than would ordinary molecular hydrogen. Discharge of the hydrocarbons from the tube AB is by an outlet K, which permits it to flow into a tank. A source of vacuum M is connected to the tank L in order to maintain a vacuum in the treating tube AB and also to the supply tank D. This latter connection serves to remove any dissolved gas from the hydrocarbons as they enter the tank. The whole apparatus has to be enclosed in an electrostatic or magnetic field so as to keep the atoms of hydrogen moving in a single direction and prevent accidental collisions, which would reduce the duration of the atomic phase of the hydrogen.

# A Useful Balance

OERTLING, of Holborn Viaduct, who have made balances for more than 90 years, have now produced an aperiodic prismatic-reflecting balance (No. 62) for weighing up to one gram to the nearest 1/10 mgm. rapidly and accurately without opening the balance case. This instrument marks a great advance in the matter of sheer usefulness. An air brake is applied to the swing of the beam which is brought to rest in about 30 seconds, but when desired the degree of damping can be varied by means of an adjustable air vent. A lamp placed outside the balance case illuminates the graticule attached to the end of the pointer, and the magnified image is projected upon a screen conveniently placed at the top of the balance case. The scale on the graticule goes up to 100, corresponding with 0.0100 gram. A special attachment fitted at the right-hand side of the case consists of a rotating dial which can be moved in either direction and works in conjunction with a series of lever arms by means of which varying weights up to a total of 0.99 gram may be added to the right arm of the beam. The weights are so designed that they cannot move out of their correct position, and the added weight can be read direct from the dial. The weights are added to an auxiliary beam suspended from the top of the pan stirrup. Only two movements, for outer and inner knob upon the dial, are needed to apply any weight from 0.01 to 0.99 gram, so that weighings involving four decimal figures below one gram can be completed in seventy seconds from the moment of closing the balance case.

**Oertling aperiodic prismatic reflecting balance, No. 62.**

### IMPROVED PLASTIC

An interesting suggestion for the production of an improved plastic material of the methyl polymethacrylate type is made by Röhm and Haas (F.P. 854,730). Methyl polymethacrylate, they point out, is very resistant to heat, but it softens even in hot water and is quite soluble in organic solvents. Their suggestion is that the methyl polymethacrylate can be mixed with vinyl methacrylate. This latter is hard, colourless and transparent, softens at about 150° C., and is insoluble in the ordinary organic solvents. Even the addition of only a small percentage of the vinyl methacrylate will greatly improve the characteristics of the methyl polymethacrylate, they claim.

# ALKALI ACTIVATION OF CARBONISED FUEL

## The Production of Reactive Gas Coke

THE increase in reactivity obtained by the addition of alkali to solid fuels is a well-established phenomenon and there is a very considerable body of technical literature on the subject. The mechanism of the activation is still obscure, but the observed fact is that the addition of small amounts of certain alkali metal salts increases the reactivity of solid fuels to oxygen, carbon dioxide and steam. In the case of carbonised fuels the alkali may be added to the coal before carbonising or to the coke after carbonising.

A paper presented to the Institution of Gas Engineers by H. H. Thomas, Chief Chemist, Liverpool Gas Co., and P. J. Askey, Research Department, I.C.I. (Alkali), Ltd., describes the operation on the works scale of the process by which the combustibility of a carbonised fuel is increased by the addition of alkali. The alkali used is sodium carbonate and it has been shown that only 0.5 per cent. is required to obtain the desired increase in reactivity in the presence of a specified minimum quantity of lime, when the materials are added prior to carbonisation, and the main part of the paper describes the investigation of this side of the process.

A similar increase in reactivity can be obtained by the treatment of coke, after carbonisation, with a solution of sodium carbonate, and the final sections of the paper deal with the methods by which the various difficulties here involved were attacked by experimental methods. Chief among these difficulties has been that of controlling the amount of alkali added, and the invariable formation of a white surface when coke, dipped in a solution of sodium carbonate, is dried. Moreover, as it did not seem practicable to add lime after carbonising, previous experience had indicated that the amount of sodium carbonate alone which would be required would probably be uneconomically high.

In the Research Department of I.C.I. (Alkali), Ltd., there has recently been carried out some work on the dust-proofing of coal and coke by treatment with a solution of calcium chloride. The normal technique for this treatment is to subject the fuel to a highly atomised spray of the solution. It occurred to the authors that this technique might profitably be used for the addition of sodium carbonate to coke for the preparation of a reactive fuel for producer gas traction. For this purpose it did not seem likely that a white coke would be so disadvantageous as it would be for domestic use.

### Avoidance of Alkali Film

A number of experiments on spraying coke under various conditions have therefore been carried out, and it has been surprising to find that if certain conditions of treatment are observed the coke is not left covered with an objectionable white film of sodium carbonate. The coke absorbs the fine spray particles and is practically unchanged in appearance. The work on this subject is still very far from complete, but brief mention may here be made of some of the factors already established which it is hoped will provide the basis of a satisfactory process for the preparation of both domestic open grate coke and motor vehicle produced coke by treatment after carbonisation. The most important factor appears to be that the coke surface must not be flooded with the solution so that a continuous film is formed over the external surface. If this occurs, a white coke is produced, but if the spray particles are sufficiently small and the rate of spraying is not too great the coke will absorb the spray continuously, and the amount of alkali which ultimately remains on the surface is only sufficient to cause a general lightening in the normal grey colour of the coke, with perhaps occasional white areas where some shale or less absorbent coke particles have been unable to take up the solution. An important point is that the penetration of the alkali into the coke when treated in this manner leaves no loose surface film of alkali which can be lost or can be a nuisance in subsequent handling. It is possible that the reason a white external surface film is formed when coke is dipped or is sprayed too rapidly may be that the pores of the coke are covered with liquid and become air locked, thus preventing further penetration of the solution.

### Apparatus Described

The most satisfactory results have been obtained when the coke particles are moving in the spray mist, thus presenting continuously changing surfaces to the impingement of the spray. This decreases the chance of flooding any particular portion of the surface. It has also been found advantageous to spray coke when it is hot. This brings into operation the suction effect due to the cooling of the coke and allows the spraying time to be decreased, and also probably allows greater penetration of the solution. It has the further advantage of drying off the greater part of the water added in the spraying process. In the small-scale experiments use has been made of a rotating drum with small lifting flanges in which the coke particles are continually rolling over on themselves, and spray nozzles are fixed on a pipe along the axis of the drum. In this apparatus, with coke heated to about 150° C. and a spraying time of 1 to 2 min., 1½ and 2 per cent. of sodium carbonate have been added, and the coke scarcely differs in appearance from ordinary coke. A rotary louvre drier has recently been converted to provide a continuous process. The coke is fed at one end and heated by flue gas in the first portion of the drum and sprayed in the remainder. The temperature of the coke and the rate of spraying can be suitably adjusted to the rate of coke feed to give the desired amount of alkali impregnation. The preliminary results have been very promising.

These experiments have so far been carried out in the laboratory. In the works it should, in many cases, be possible to treat the graded coke passed directly from the vertical retorts through a crushing and screening plant. Under these circumstances the coke would probably retain sufficient heat to be sprayed directly, without the necessity of reheating.

The results have so far indicated that by the addition of 1½ to 2 per cent. of sodium carbonate the reactivity is brought to the same level as by the pre-carbonising treatment. This quantity of alkali is less than the amount which has generally been regarded as necessary when sodium carbonate alone is used. Most experiments on the quantity of alkali required have been made by addition of alkali before carbonising, and under these conditions the alkali is probably more exposed to the effect of the ash than in the post-carbonising method. When alkali is added after carbonising, the ash can combine with it only during combustion and the alkali is apparently able to exert its activating function before it reacts with the ash.

It is appreciated that there is a great deal more work to be done before this method of applying alkali activation can be regarded as completely established, and, in attempting to transfer it to full works scale there will undoubtedly be further difficulties to overcome. But it is felt that the advantages of an alternative method of applying alkali activation which avoids any possibility of damage to retort refractories, however slight, are sufficiently great to justify the presentation of these preliminary results for discussion. It is too early in the investigation to make any detailed estimate of addition of 1½ to 2 per cent. sodium carbonate is required, and the cost of the spray treatment. But assuming that an alkali that there is about 25 per cent. breeze formation in preparing graded domestic coke, the cost should be approximately the same as for the pre-carbonisation treatment.

# Recent Trade Literature

A new booklet on "Clarification and Sterilisation" has been published by A. GALLENKAMP AND CO., LTD. Of particular interest are the pages featuring sintered filtration apparatus which is now manufactured by the company and which takes the place of the well-known German glassware.

The June issue of the LINDE AIR PRODUCTS CO.'S journal, "Oxy-Acetylene Tips," contains a number of articles on subjects ranging from new procedures for hard-facing wearing parts with Oxweld welding parts to operating instructions for the storage and handling of calcium carbide.

THE LENNOX FOUNDRY CO., LTD., recently issued a new general leaflet (No. 0491) illustrating some of the plant and equipment manufactured by the company for the chemical and allied industries. In view of the paper shortage the company has decided not to re-issue separate leaflets describing in detail various specialities, but to concentrate on a general leaflet. Among the apparatus mentioned in the latest publication are gas absorption plant, heat exchangers, distillation plant, pumps for corrosive liquids, acid resisting plant in Tantiron, acid resisting plant in lead and regulus metal, and laboratory and small-scale plant.

Many firms have provided for possible breakdown in power and lighting supplies by installing emergency sets either for complete change-over, or for essential services such as ventilation and lighting in air raid shelters, etc. A selection of such installations is described in a recent issue of "Crossley Chronicles," published by CROSSLEY BROTHERS, LTD. Somewhat special arrangements are featured rather than straight power and lighting sets so as to add interest to the publication. The possibility of air raids is much greater now than in September last, and it is a wise precaution to instal independent power supply.

Streamlined hydrometers are featured in a brochure recently issued by GRIFFIN AND TATLOCK, LTD. They are made with cylindrical streamlined bulbs and have been introduced because of the many advantages they are said to possess over the conventional two-bulbed pattern. Among these advantages are the fact that they have excellent floating characteristics; there are no errors as a result of the trapping of air bubbles in the "waist" as was the case in the old type; there are no small delicate bottom bulbs to become broken off in the course of wiping or while inserting into the hydrometer jar; there are ranges available to cover all normal purposes.

Anyone interested in indicating, in recording or in controlling temperatures automatically, should find of value Broadside N-33, issued by LEEDS AND NORTHRUP CO., Philadelphia, U.S.A. In it a special effort has been made to describe briefly the complete list of industrial temperature instruments manufactured by the company. Spread out on desk or table, the catalogue shows at a glance the choice of equipments available for a given job, the important features embodied in each and the specific publications to which anyone interested can turn for more detailed information. There is also a concise discussion of the thermocouples, Rayotubes, Thermohms and Optical-type temperature detectors available.

HADFIELDS, LTD., Sheffield, have issued a brochure dealing dealing with "Hadmang" electrodes and welding rods for welding manganese steel and other steels. These electrodes and welding rods are made from special manganese steel of patented composition in which a proportion of nickel is included. The result of this is to reduce the tendency to the separation of carbides and to give the deposited metal an air toughening quality. At the same time it is claimed that as a result of the diffusion of this improved weld metal, the harmful results of heating the parent metal in the zone adjacent to the weld junction are reduced to a minimum, thus obtaining an infinitely longer life of the welded or rebuilt part.

THE REPUBLIC CHEMICAL CORPORATION, New York, have issued their price list of chemicals for the spring of 1940. Over 170 chemicals and their F.A.S. price per 1000 kilos are listed.

W. EDWARDS AND CO. (LONDON), LTD., have issued a new catalogue dealing with three high vacuum pumps. The pumps are of the Metrovac series and comprise single-stage and two-stage models. They operate on the slotted rotor and sliding vane principle and are of the oil-sealed type.

THE CHEMICAL PUBLISHING CO., INC., New York, have issued several pamphlets drawing the attention of chemists to a number of technical books just published. The subjects they cover include electrocapillarity, textile testing and soap manufacture.

A system of ventilation which obscures light yet permits adequate ventilation is described in a booklet issued by COLT VENTILATION, LTD. The disastrous effects of bad ventilation on workers' health with consequent loss of production emphasises the importance of an efficient system of ventilation during black-out hours.

HUGH WOOD AND CO., LTD., Team Valley Trading Estate, Gateshead, have issued a pamphlet dealing with rigid straight-line sections used in the "Huwood" fully-troughed bottom belt gate conveyor. The sections are made up of 4 in. by 2 in. R.S. channel side frames, 12 ft. lengths, with strong cross-bracings which act as supports for carrying rollers. The whole 12 ft. section is light enough to be carried by two men.

The latest issue of "Alloy Metals Review," published by HIGH SPEED ALLOYS, LTD., contains a number of interesting features including articles on the following subjects:—Silicon-Molybdenum-Vanadium Steels, Nitriding High-Speed Steel, High-Speed Steel Forgings, Molybdenum and Vanadium in Chromium Steels, and a Metallurgical Survey of Machine Cutting Tools.

A recent issue of "The Welder," published by MUREX WELDING PROCESSES, LTD., is notable for a number of interesting articles. The welding of warships with particular reference to the defeat of the *Graf Spee* is a topical subject discussed, and space is devoted to lightweight passenger rolling stock, to electric welding as an integral part of structural design and to some observations on metallic fluxes.

A new material recently put on the market by J. H. SANKEY AND SON, LTD., is described in a leaflet issued by the company. Described as "Sankey's Super Acid-Resisting Cement" it has been produced after long research and is supplied in a fine powder which has to be mixed with Sankey's acid resisting solution. This cement withstands attack by all acids with the exception of hydrofluoric acid. It trowels easily and approximately 12 hours after application sets to stone or porcelain-like hardness.

## MERCURY PURIFICATION

A simple and interesting method for the purification of mercury used in laboratory work is suggested by Dobrowski (Chem. Z., 1940, p. 32). The mercury is mixed with a cold saturated solution of potassium permanganate and well shaken. This causes the permanganate to change to a greenish or brown colour, manganese dioxide being formed which emulsifies the mercury. The mixture is then diluted with water and decanted, the mercury remaining being then treated with a fresh permanganate solution until its colour remains unchanged for 30 seconds. The permanganate and manganese dioxide are removed by adding a little dilute nitric acid which dissolves the dioxide and allows the mercury to drop in normal liquid form to the bottom of the vessel. It can then be separated from the liquid used to wash it by means of a funnel with a cock, and any remnants of moisture in the mercury removed by running it over blotting paper.

# Soap Suppliers Admit Error

### The Importance of Adhering to Specification

LAUNDRY soap which did not come up to the standard submitted when a contract was placed by the Salford Corporation Central Purchasing Committee is the subject of comment in the annual report of Mr. G. H. Walker, Ph.D., F.I.C., analyst to the Corporation. He states:—

"A sample of laundry soap, although practically in accordance with the specification, was very inferior to the sample actually selected at the time the contract was placed. The conditions of the contract rightly specify that 'the whole of the . . . materials to be supplied under the contract must be . . . identical with the samples sent with the tender.' This is a most important clause, as a specification is, after all, primarily a statement of the minimum requirements acceptable, and, should a contractor submit a superior article at a competitive price and thereby improve his chances of obtaining the contract, it is only right that the department should insist on obtaining that quality throughout the contract period. The suppliers of the soap in question were interviewed and they stated that the mistake had originally arisen from their having accidentally submitted a superior quality of soap at the time of tendering; they admitted their responsibility, however, and readily agreed to make future deliveries of the better quality and to replace any stocks that had been questioned."

# Motor Oil Regeneration

### Suggested French Plant

USED lubricating oils can be efficiently treated to eliminate the impurities accumulating during normal use. These include tars and asphalts as well as fine particles of carbon formed by chemical changes, metal particles resulting from friction with metal parts, and dust, sand, etc., from the roads. Regenerated oil is said to give better service than fresh oil because of its greater resistance to oxidation. Plant required for treatment is relatively simple and can be operated by unskilled labour. The used oil is first brought into large tanks and heated to about 80° C., when the oil itself rises to the surface while water and the whole of the solid matter with the exception of colloidal carbon settles down. After decantation the oil is stirred with fullers' earth to remove the finer impurities and obtain a light-coloured oil. This is filtered in a press and finally heated in a still to drive off any heavy petrol fractions which may have gained access during use.

According to Ch. Berthelot, writing in *Chimie et Industrie* (May 20, 1940, p. 877), the following plant would be suitable for dealing with an annual throughput of 12,000 to 20,000 tons used oils (smaller plants might not prove so economical): 6 decanting tanks, each of about 12,000 gallons; 3 bleaching earth-treatment tanks, hourly capacity of 3 tons each; 3 filter presses, also capable of dealing with 3 tons hourly; 2 storage tanks for regenerated oil, each of 2000 gallons; 2 heaters, each with 450 sq. ft. of heating surface. Running costs of such a plant are estimated at about 9d. per gallon and the recovery yield amounts to 70-80 per cent.

# Flow and Drop Points of Fats

### New British Standard

THE British Standards Institution has issued a specification (No. 894-1940) for the apparatus for the determination of the flow and drop point of fats and allied substances. The apparatus is of the Ubbelohde type. The standard thermometer specified is one from Series C of B.S. 593, with certain modifications; the glass cup is specified, also the metal fitting for the thermometer and certain auxiliary apparatus. The method of use is also stated and it is pointed out that the precise method of filling the cup varies with different substances, so that when the use of the apparatus is prescribed for any substance the method of filling must be defined.

# Mercury Figures for the U.S.A.

### Marked Rise in Prices, Imports and Exports

WORLD events in 1939 had a marked influence on the mercury industry in the United States and, combined with conditions within the industry itself, caused sharp fluctuations in the price, according to the Bureau of Mines, U.S. Department of the Interior. In January the monthly price was $77.44 a flask. There was an upward movement in the early months of the year due to political tension abroad and to the speculation over what would be the selling policy for Italian and Spanish mercury should Franco win the Spanish civil war. Prices eased following Franco's victory and the resumption of combined selling by Mercurio Europeo, signalling attempts to market large quantities of metal rather than to run up the price. Upon the outbreak of the war in September apparently some consuming countries were found to be under-supplied. The United States, for example, had substantially lessened her importation of mercury since late in 1937 and had not increased domestic production to offset the decline in imports. Consumers' stocks in the United States must have been drawn on in 1938 and up to the opening of war in September, 1939. Prices in the United States jumped in September and averaged $140.00 for the month; they rose to $145.60 for October; declined to $134.98 in November, and were $141.20 in December. During this period the foreign price lagged greatly behind the domestic one. Whereas the price differential in favour of selling in the United States was $6 to $11 a flask for the first eight months of the year as against the tariff of $19, in September it rose violently to $49. This jump was largely due to the decline in the exchange rate for the pound. Late in the year production in the United States began to respond to increased prices and imports rose. Conditions for obtaining supplies abroad became more difficult, however, and the foreign price rose precipitously, leaving the domestic price protected by tariff far behind. In February, 1940, the Cartel price rose to $205 c.i.f. New York, duty unpaid, and that for domestic metal was quoted at $178 to $182 a flask.

Domestic production amounted to 18,633 flasks, the highest since 1931, but only 10 per cent. above the average for the 5-year period, 1934-38. Of outstanding interest was the rise of the Bonanza mine, Douglas County, Oregon, to second place in production. The Idaho Almaden mine, producing for the first time, joined the list of leading producers in 1939, but the Oceanic and Cloverdale mines, which produced important quantities of mercury in 1938, were idle in 1939. The principal producing mines in 1939 were as follows: Valley mine, in Arkansas; Mt. Diablo, Great Western, Mirabel, Sulphur Bank, Oat Hill, New Idria, Klau, and New Almaden mines, in California; Idaho Almaden mine in Idaho; Wooten and McCown mine, in Nevada; Bonanza, Horse Heaven, and Black Butte mines, in Oregon; and Chisos and Rainbow mines, in Texas. These 16 mines produced 88 per cent. of the country's total.

Imports of mercury for consumption in the United States rose from 2362 flasks in 1938 to 3499 flasks in 1939. Spain supplied 2601 flasks, Mexico 562 flasks, and Italy 336 flasks. Of the total received, 1111 flasks were entered in November and 1776 flasks in December. Exports of mercury amounted to 1208 flasks in 1939 compared with 713 flasks in 1938. Of the 1939 total, 304 flasks were consigned to Canada, 206 flasks to the United Kingdom, and 177 flasks each to Japan and South America.

THE WATER AND FORESTRY SERVICE of Réunion, it is reported from Paris, is giving constant attention to the watering of 43,000 cinchona plants recently put into the soil, as well as to the development of nurseries. Areas have been created at Plaine d'Affouches and at Plaine des Fougères for the cultivation of Peruvian (cinchona) bark, in accordance with a 10-year plan prepared by the Hubert Barat mission, and effort is being made to obtain Peruvian (cinchona) bark seedlings with selected varieties of *Succirubra* and *Ledgeriana*.

# Personal Notes

MR. WALTER S. CARPENTER, JR., has been elected President of the Board of Directors of E. I. du Pont de Nemours and Co., succeeding MR. LAMMOT DU PONT who becomes Chairman. MR. PIERRE S. DU PONT, the former Chairman, continues as a member of the board.

* * *

DR. HARRY W. MELVILLE, of Trinity College, Cambridge, who was to have succeeded Professor Alexander Findlay in the Chair of Chemistry in Aberdeen University on October 1, has been asked by the Ministry of Supply to undertake special work of urgent national importance. Professor Findlay has kindly agreed to continue in the occupancy of the Chair and thus enable the Aberdeen University Court to grant permission to Dr. Melville to undertake the work for the Ministry of Supply.

## OBITUARY

MR. WILLIAM MITCHELL M'KERSIE, M.C., C.A., who died last Sunday in Glasgow, was a director of Messrs. Edward Macbean and Co., Ltd., oilskin manufacturers, and of Messrs. Farquharson Bros., Ltd., carbon paper manufacturers, both of Glasgow.

* * *

SIR ARTHUR HARDEN, who died on Monday at Bourne End, aged 75, was especially distinguished in the biochemical field. He was a native of Manchester and was educated at Owens College, where he served as lecturer and demonstrator in chemistry from 1888 to 1897. Proceeding next to London as chemist to the British Institute of Preventive Medicine (now the Lister Institute), he became head of its biochemical department and Professor of Biochemistry at London University, a position from which he retired in 1930. He was D.Sc. of Manchester University and Ph.D. of Erlangen, and held honorary doctorates at Manchester, Liverpool, and Athens. He was elected F.R.S. in 1909 and received the honour of knighthood in 1936. In 1929 he shared the Nobel Prize for Chemistry with von Euler and in 1935 he was awarded the Davy Medal of the Royal Society. He was specially noted for his work in the chemistry of alcoholic fermentation and his name is commemorated by the "Harden-Young ester" (fructofuranose diphosphate), which plays an important part in the "pre-fermentation" stage of glucose decomposition. From 1913 to 1937 Harden was editor of the *Biochemical Journal*. His publications included courses for students in both Inorganic and Organic Chemistry, and a text-book on Alcoholic Fermentation.

# A Chemist's Bookshelf

CHEMICALS OF COMMERCE, by F. D. Snell and C. T. Snell. London: Chapman and Hall. Pp. viii and 542. 28s.

The transatlantic origin of this volume is betrayed by its spelling, its references, and the occasionally rather annoying mixture of degrees C. and degrees F. for parallel boiling-points on the same page. Actually, however, it serves its purpose very well, and British chemical authors, when time and circumstances permit, might do worse than produce a corresponding volume giving their own point of view. The grouping of products under 36 heads makes for convenience of comparison, and a full and carefully compiled index allows of simple and rapid reference.

INTRODUCTORY COLLEGE CHEMISTRY, by N. E. Gordon and W. E. Trout, Jr. 2nd Ed. London: Chapman and Hall. Pp. xiii and 753. 21s.

This is another of the many excellent books of American origin dealing with the educational approach to chemistry. A specially valuable feature for the student is the series of references to the excellent articles that have appeared in the *Journal of Chemical Education*. The text has been modernised and illustrations added in this edition, but ultra-modern speculative theories have not been listed as facts, a defect that mars some other volumes of similar nature.

# British Chemical Prices

## Market Reports

VALUES in the general chemical market have remained steady during the past week and there are no important alterations in prices to record in any direction. Regarding the volume of trade transacted this has been relatively good and spread over most sections of the market. Dealers report a steady flow of inquiry both for home and export with buyers calling for satisfactory quantities against existing contracts. Trade in coal tar products during the past week has been rather on the quiet side with only a moderate volume of export inquiry in evidence. The undertone of the market is steady with prices unchanged at recent levels.

MANCHESTER.—Whilst this week's war developments have not been without their disturbing influence on the Manchester chemical market they have had no reactionary effect on prices, the majority of which remain on a distinctly firm basis. Contract deliveries of most descriptions, especially of those used in the dyeing, finishing and allied trades, have been on steady lines, whilst a moderate amount of fresh inquiry has been reported. With regard to the tar products a firmer tendency is still in evidence in several sections, more particularly in the light products and also in the naphthalenes.

GLASGOW.—From the inquiries received and the orders fixed this last week, it would appear that industrial concerns are now working at war-time pressure. This has naturally stiffened the prices in most chemicals, and the indications are that prices will be well maintained. Naphthalene, Oxalic Acid, Caustic Potash, and Carbonate of Potash are in short supply, with prices nominal.

## Price Changes

**Creosote.**—Home trade, 4¾d. to 5½d. per gal. f.o.r. makers' works; export, 6d. to 6¼d. per gal., according to grade. MANCHESTER: 5d. to 7d. per gal.

**Citric Acid.**—MANCHESTER: 1s. 5d.

**Cresylic Acid.**—99/100%, 2s. 11d. to 3s. per gal., according to specification. MANCHESTER: Pale, 99/100%, 2s. 9d.

**Naphthalene.**—MANCHESTER: Refined, £34.

**Pyridine.**—MANCHESTER: 19s. to 22s. 6d. per gal.

**Tartaric Acid.**—MANCHESTER: 1s. 9d. per lb.

## Oil Prices

**Rosin.**—25s. to 30s. per cwt., ex wharf according to grade.

# Export Groups Formed

## China Clay

THE China Clay Producers' Federation, Ltd., whose registered office is at Barclay's Bank Chambers, St. Austell, Cornwall, has received the recognition of the Export Council of the Board of Trade as the Export Group of the China Clay Industry. Of approximately 40 firms and companies producing China Clay, 32, comprising about 90 per cent. of the output, have already joined the Group. Full particulars can be obtained at the registered office of the Federation.

The Chairman of the Group and of the Federation is Mr. W. Prescott, of 21 Tothill Street, London, S.W.1, and the Secretary is Mr. Walter H. Graham, of Barclay's Bank Chambers, St. Austell.

## IMPORT LICENCES FOR PETROLEUM PRODUCTS

Import licences for petroleum, both crude and refined, and for all petroleum products, including paraffin wax, petroleum bitumen and medicinal paraffin, will be issued on the advice of the Petroleum Department. Applications for licences should be addressed to the Petroleum Department, Westminster House, Dean Stanley Street, Millbank, London, S.W.1.

## OVERSEAS TRADE IN MAY

Despite the drastic reduction in trade with Scandinavia and the Baltic countries and the invasion of the Low Countries, exports exceeded slightly the average for the two preceding months and all three main classes shared in the increase. Exports of chemicals, drugs, etc., were, apart from April, the highest for twenty years. Total imports showed a fall from the average of March and April, but there was a small rise in those of raw materials.

# General News——From Week to Week

THE INTERNATIONAL SOCIETY of Leather Trades Chemists and the London Leather Industries Laboratory announce that on and after June 24 their address will be Bank Chambers, 92 Tooley Street, London, S.E.; telephone number as hitherto.

MESSRS. OHLENSCHLAGER BROS., LTD., importers and exporters, announce that, on account of the expiry of the lease of their city offices, they have, as a temporary measure, removed to their Bermondsey premises. Their address is now 175 Bermondsey Street, London, S.E.1 (Tel.: HOP 2713).

IN THE HOUSE OF COMMONS last week Mr. Herbert Morrison, Minister of Supply, announced that approval had been given to the appointment of a qualified chemist with special research experience to serve in the salvage department of the Ministry of Supply.

THE ANNUAL REPORT of the Manchester Corporation Electricity Department records an increase in the sales of electricity to chemical works, dyeworks and rubber factories of 26 per cent. in the year to March 31 last. The increase for the engineering industry was 21.5 per cent.

LONG SERVICE awards were presented to 119 employees of the Castner Kellner works of Imperial Chemical Industries, Ltd., at a ceremony at Runcorn last week. The awards were distributed by Mr. G. K. Hampshire, a delegate director of the General Chemical Group of I.C.I.

OWING TO THEIR OFFICES at 2 Caxton Street, London, S.W.1, having been requisitioned by the Government, Messrs. J. F. Crowley and Partners, consulting engineers, have transferred to 54 Victoria Street, London, S.W.1 (at the junction of Victoria Street and Buckingham Gate) where they are reinstalling their physical and chemical laboratories (Tel.: VICtoria 8331-2).

FIRE BROKE OUT LAST WEEK at the Clippens Chemical Works, Linwood, Renfrewshire. The premises involved were two large buildings packed to the roof with wood chips, and such was the nature of the blaze that members of the West Renfrewshire Fire Brigade were in attendance for several days before the outbreak had been mastered.

OWING TO THE DEARER MARKET for raw materials, May and Baker, Ltd., have announced an increase in the prices of sodium tartrate and potassium B.P. (Rochelle salt), Seidlitz powder B.P. and double Seidlitz B.P.C. Rochelle salt is advanced 20s. per cwt., Seidlitz powder 15s. per cwt., and double Seidlitz 17s. per cwt.

A PROCESS WORKER who was found lying dead in a strong concentration of ammonia gas at the bottom of a steel ladder in the anhydrous filling plant at the I.C.I. works at Billingham was stated at the inquest at Middlesbrough to have died from heart failure. The fact that he was found dead in the gas did not relate at all to the cause of death. A verdict in accordance with the medical evidence was recorded.

THE SALVAGE OF WASTE PAPER will materially assist the British china-clay industry, states a director of the largest china-clay producing firm in the St. Austell district. When paper is re-pulped and re-manufactured more china clay is used than in the original manufacture—about 30 to 40 per cent. as against 15 per cent. and upwards. In the last war repulped paper was principally used in making wrapping paper, but now quite satisfactory newsprint can be produced, and other kinds of white paper as well. Shipments of china clay and china stone for May totalled 53,130 tons; the rail-borne traffic accounted for 10,421 tons. Though lower than the April figures, these amounts are better than was expected.

THE SECRETARY OF THE D.S.I.R. announces that the Government has gratefully accepted the offer of the Imperial College of Science and Technology to place at the Department's disposal for the period of the war all the accommodation of the Biological Field Station at Slough that is required for the purposes of the Department's work on the infestation of produce by insects. The Department has now taken into its own employment the staff of the Imperial College hitherto engaged on the Department's work in this field, and has secured the services of Professor J. W. Munro as consultant. All correspondence on the infestation of produce by insects intended for the Department should be addressed to the Officer-in-Charge, Pest Infestation Laboratory, Biological Field Station, Slough, Bucks.

THE BOARD OF TRADE INDEX FIGURE for the prices of chemicals and oils in May, 1940, is 115.6 (1930 = 100). This marks an increase of 1.4 per cent. over April, 1940, and 23.6 per cent. over May, 1939, and is mainly due to the advance in the prices for petroleum products. The figure for all industrial materials and manufactures for the month of May is 136.4. Iron and steel were actually lower than in April by 0.1 per cent., at 152.6, and non-ferrous metals were up to 123.7, a rise of 0.6 per cent.

## Foreign News

THE PRICE OF CHILEAN NITRATE was raised last week from £9 10s. to £10 per ton, on the basis of 2-ton lots f.o.r. Liverpool.

SULPHUR PRODUCTION IN CHILE is to be nationalised; a bill has been introduced for the acquisition of all sulphur deposits, whether under Chilean or foreign ownership.

CALCIUM CARBIDE EXPORTS from Yugoslavia during 1939 totalled 11,608 metric tons, as compared with 18,959 in 1938 and 5856 in 1937. The chief markets in 1939 were the Netherlands, with 7132 tons, and the United Kingdom, with 2775 tons.

FROM 30 TO 50 PER CENT. of Palestine's requirements in agricultural insecticides, it is estimated, are now manufactured locally. Imports under this heading during 1939 were valued at £P14,500.

BY A DECREE published in the Hungarian official journal of May 30, the import of 25,000 quintals of copper sulphate will be allowed into Hungary free of duty between June 1 and November 30.

AS A RESULT OF ARRANGEMENTS recently concluded, the whole of the United States, South America, Philippine, Belgian Congo, China, Thai and Asiatic-Turkey interests of Lever Brothers and Unilever N.V. have been transferred to a South African subsidiary company which is operating from Durban.

A FURTHER REDUCTION in the price of transparent cellulose film, due to the increasing use of this material, is announced by the Cellophane Division of Canadian Industries, Ltd. This is the eleventh price reduction brought into effect since manufacture was started in Canada eight years ago.

ACCORDING TO STATISTICS issued by the Federal Reserve Bank of New York, net profits of the 55 corporation groups in the chemical and drug industries of the United States totalled $209,800,000 in 1939, against $140,700,000 in 1938 and $220,000,000 in 1937.

THE UNITED STATES BUREAU of Foreign and Domestic Commerce records a sharp gain in U.S. imports during 1939 of strontium minerals. The United Kingdom furnished 5,623,228 lb. of celestite. All the imports of strontium nitrate and precipitated strontium carbonate originated in Germany.

THE BOARD OF I.G. FARBENINDUSTRIE proposed an unchanged dividend of 8 per cent., on a capital increased from 680 to 691 million Rm., at the annual meeting of the company called for June 21 at Frankfurt-am-Main. Net profits for 1939 totalled 56,071,000 Rm., against 55,180,000 Rm. in 1938, and depreciation on plant, etc., was 171,240,000 Rm., against 132,730,000 Rm.

IT IS REPORTED FROM NAIROBI that pyrethrum has become one of the important exports of Kenya. Exports for 1938 were 1799 long tons, valued at £180,043. During the first ten months of 1939 exports amounted to 2030 tons, valued at £255,908, thus exceeding the volume and value for the whole of 1938. The price has risen to £175 a ton, and growers fear that chemical substitutes may be found if the price should continue to increase.

## Forthcoming Events

THE ANNUAL GENERAL MEETING of the Society of Chemical Industry will be held at 2.30 p.m. on July 9 in the Lecture Theatre of the Royal Institution, Albemarle Street, London, W.1, and will be followed by Professor Philip's presidential address. Tea will be served at about 4.15 in the Long Library by invitation of the president, and the Messel Medal will be presented in the Lecture Theatre at 5 p.m. to the Rt. Hon. Viscount Samuel, after which the medallist will deliver an address.

# Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

## Mortgages and Charges

**(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)**

BRITISH EMULSIFIERS, LTD., Hanworth. (M., 22/6/40.) June 4, £20,000 debenture (subject to etc.), to Branch Nominees, Ltd.; general charge. *£2891. January 5, 1940.

FERGUSON EDWARDS AND CO. (LONDON), LTD., paint manufacturers. (M., 22/6/40.) June 4, mortgage to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; charged on moneys due under a certain contract. *——. February 10, 1938.

## County Court Judgments

WRIGHT, FREDK., 57 Fairfield Road, Stockton Heath. (C.C.J., 22/6/40.) Analytical chemist. £18 7s. 6d. May 2.

## Receivership

R. G. HARBOTT AND CO., LTD., Victoria Works, Romford Road, E.7, manufacturing chemists, etc. (R., 22/6/40.) Edward W. Rollings, The Pynes, Loom Lane, Radlett, Herts.

# Company News

**Wailes Dove Bitumastic Co., Ltd.,** have declared an interim dividend of 5 per cent., less tax, on the ordinary shares (the same).

**The Lautaro Nitrate Co., Ltd.,** have announced the payment of a dividend of 1½ per cent., actual, less tax, on income debenture stock.

**A. Boake, Roberts and Co., Ltd.,** have declared an interim dividend of 2 per cent. net on the ordinary shares (the same).

**British Luminophores, Ltd.,** chemical manufacturers, etc., 9 Drapers Gardens, E.C.2, have changed their name to British Compounds, Limited.

**The Bleachers' Association** reports a profit for the year to March 31 last of £293,321, compared with £190,412. Meeting, Blackfriars House, Manchester, June 28, at noon.

**H. R. Napp, Ltd.,** manufacturing chemists, etc., 3 and 4 Clements Inn, W.C.2, have increased their nominal capital by the addition of £10,000, in £1 unclassified shares, beyond the registered capital of £10,000.

**Crosfields Oil and Cake Co., Ltd.,** report net profits for the year to March 31, 1940, of £19,547 (£22,191), after providing for all charges, depreciation of plant, directors' fees and taxation. A dividend of 1s. 6d. and a bonus of 6d. per share, less tax (same), has been recommended. The carry-forward is £6156, and to general reserve £6000 (nil).

**W. J. Bush and Co., Ltd.,** report that before taxation the net profit of the company in 1939 amounted to £120,700, more than double the previous year's figures of £54,721. The ordinary dividend is maintained at 10 per cent. with a final dividend of 6 per cent. The provision for taxation and contingencies has increased from £23,491 to £63,610. The carry-forward is up by £25,840 to £139,933. The meeting will be held at the Great Eastern Hotel, Bishopsgate, E.C., on June 24 at 11 a.m.

**Peter Brotherhood, Ltd.,** report a gross profit in the year to March 31 last of £145,269, compared with £99,590. The whole of this increase, however, was absorbed in additional taxation, the past year's charge of £63,500 comparing with £16,250 in 1938-39. After fees and allowing £4819 for war risks insurance, the net profit is down from £81,924 to £75,550. A further £10,000 has been set aside for special depreciation and £7500, as before, for A.R.P., leaving the carry-forward at £118,242 as against £104,266. The meeting will be held at Winchester House, E.C., on June 25, at 11.45 a.m.

**Lever Brothers and Unilever, Ltd.,** have concluded arrangements to protect shareholders in the Dutch concern while the territories in which that company operates remain under German occupation. The British company is making a reserve out of its profits for 1939 to enable a distribution to be made after the war to the ordinary shareholders of the Dutch concern, equivalent in value to the dividend received by shareholders in the British concern over the same period. This only applies if no dividend, or dividends of less value, have been paid by the Dutch concern during the war period.

# New Companies Registered

**Newcol, Ltd.** (361,831).—Private company. Capital £500 in 500 shares of £1 each. Colour manufacturers and merchants, chemists, drysalters, etc. Subscribers: John R. Charlesworth, 85 St. Petersgate, Stockport; Harold Houghton. Solicitors: F. Newton and Son, 85 St. Petersgate, Stockport.

**Nova Oil and Solvent Co., Ltd.** (361,742).—Private company. Capital £2000 in 1300 6 per cent. cumulative participating preference shares of £1 and 7000 shares of 2s. Manufacturers, refiners, blenders and importers of and dealers in oils and oleaginous compounds and emulsions, etc. Directors: Frank L. Keen, 47 Vaughan Avenue, Cardiff; Dennis R. Baston, Chas. C. Dicker, John C. Jones.

**Organic Fertilisers, Ltd.** (361,282).—Private company. Capital £1100 in 100 5 per cent. cumulative redeemable preference shares of £10 each and 2000 ordinary shares of 1s. each. Manufacturers, importers, exporters, buyers and sellers of and dealers in artificial manures, cattle foods, fertilisers, organic and chemical fertilising compounds, catalytic agents, microbic organisms and agricultural products of all kinds, etc. Subscribers: Claude H. Treble, 15 Maybank Avenue, Sudbury, Wembley, Middlesex, and John Richardson. Solicitors: Clifford-Turner and Co., 11 Old Jewry, E.C.2.

# Chemical and Allied Stocks and Shares

As was to be expected, reactionary conditions have ruled on the Stock Exchange owing to the latest war developments. Security values were marked down by dealers as a precautionary measure earier in the week, but when it was apparent that there was again no likelihood of heavy liquidation, better market conditions were in evidence, and, following the Prime Minister's speech, improved demand was reported for British Funds and other good class investment securities. Nevertheless, demand for industrial shares has been so small that in the majority of cases it is doubtful if quotations have been adequately tested this week.

Securities of chemical and kindred companies have been marked down in accordance with the general tendency, and as usual the widely-held shares have reflected the prevailing market trend most closely. It should, of course, be borne in mind that the lower share prices do not necessarily indicate that less hopeful views are current in regard to the outlook for individual companies, and they have to be read in relation to current conditions on the Stock Exchange. At the time of writing Imperial Chemical have moved down to 24s. 3d., which compares with 26s. 9d. a week ago, while the preference units were no better than 29s. 6d., a decline of 2s. 3d. on balance. Business in Fison Packard took place around 33s.; a week ago the quotation was 36s. 3d. B. Laporte were little changed and were quoted at 50s., but were apparently tested by very little business. Distillers were 4s. down at 52s., although hopeful views remain current in the market in regard to the forthcoming dividend announcement. Lever and Unilever were lower at 21s. 3d.; the company has concluded arrangements to protect shareholders in Lever (N.V.) while the territories in which the latter operates remain under German occupation. Borax Consolidated at 22s. 6d. showed a decline of 1s. 3d. on balance, and Imperial Smelting were lower. British Oil and Cake Mills preferred ordinary remained at 33s. 9d. and British Match at 28s. 9d. were within 1s. of the price current a week ago. Most textile shares, including Courtaulds, were marked down. Courtaulds' interim dividend decision is due in a few weeks, and, as usual, it is awaited with a good deal of interest. It is now thought in some quarters of the market that, in view of the company's important interests on the Continent, the directors may decide to follow the conservative policy of leaving all question of a dividend until results for the whole year are known.

British Oxygen, Dunlop Rubber and other leading industrial securities have declined sharply on balance, but the fall in prices was out of all proportion to the volume of selling. In times of very inactive markets only a small amount of selling usually results in a sharp marking down in price, because of the absence of demand. General Refractories were quoted at 6s. 6d. and Barry and Staines at 20s. Michael Nairn were 52s. 6d., awaiting the forthcoming interim dividend announcement. Pinchin Johnson were 15s., compared with 16s. 9d. a week ago, and International Paint 75s. compared with 77s. 6d. Monsanto Chemicals 5½ per cent. preference shares continued to have a "middle" price of 21s. 3d., but were inactive. Blythe Colour Works 4s. shares remained at 7s. 6d.; the interim dividend is due to be declared shortly. William Blythe 3s. shares were again quoted at 6s. 3d., but no dealings were recorded. On the other hand, British Glues were slightly lower at 5s. Boots Drug were marked down to 30s. 6d., but Beechams Pills 2s. 6d. deferred shares had a fairly steady appearance at around 7s., although the 10 per cent. preferred shares of the last-named company were lowered to 26s. 3d. Sangers were 19s., and Timothy Whites 17s. 6d. Leading oil shares were again lower in sympathy with prevailing conditions on the Stock Exchange.